MuSkLE
PhD programme
Building, maintaining and repairing the functional locomotor system

Co-funded by the European Union

PhD Position 06 job vacancy

Reference:	**PP06**
Title:	**Investigating the molecular drivers of carotid atherosclerotic plaque hemorrhage and impact of physical activity.**
Hiring institution:	**UCBL**
Location:	University Claude Bernard Lyon 1, Villeurbanne, France.
Start date:	As from 01st January 2027
Duration:	36 months
Application deadline:	6th May 2026

Job description

Objective:	**State of the Art.** Plaque vulnerability is characterized by intense neovascularization and intraplaque hemorrhage (IPH), driven by immature and leaky micro vessels arising from the vasa vasorum. Recent advances in transcriptomics, proteomics, and single-cell RNA sequencing have improved our understanding of the molecular signatures distinguishing stable from unstable plaques. However, post-transcriptional mechanisms remain largely unexplored in atherosclerosis, despite their central role in controlling protein expression and cell signaling. Our previous work showed that physically active patients with asymptomatic carotid plaques exhibit a significantly lower prevalence of IPH compared to sedentary individuals. **Hypothesis and Originality.** We hypothesis that physical activity reduces carotid plaque vulnerability by modulating translational control, phosphoprotein signaling, and systemic circulating factors. The originality of the project lies in its integrative and innovative approach, combining multi-omics analyses (proteomics, phosphoproteomics, lipidomics, metabolomics, translatomics) with spatial and functional investigations. **Methodology and Work Plan.** The project is structured around three main objectives: 1. *Effect of physical activity on plaque vulnerability* Carotid plaques collected from approximately 500 patients undergoing endarterectomy will be analyzed according to individual PA levels. Multi-omics profiling will identify molecular signatures associated with plaque vulnerability. These findings will be complemented by studies in ApoE$^{-/-}$Fbn1^C1039G+/− mice, a validated model of vulnerable plaques with IPH, subjected or not to a structured exercise training protocol. 2. *Translational and spatial characterization of plaques* Translational efficiency will be assessed through polysome profiling in human plaques and nascent protein labeling in mice. Candidate molecules will be spatially localized using MALDI mass spectrometry imaging and immunohistochemistry, allowing correlation with IPH-rich regions. 3. *Role of circulating factors and identification of therapeutic targets* Plasma proteomic and lipidomic analyses will identify systemic mediators influenced by PA. Functional validation will be performed using ex vivo human plaque cultures, endothelial cell assays, and targeted modulation of candidate molecules in animal models.
Collaborations and co-supervisions:	The PhD project will be co-supervised by Antoine Millon and Amandine Thomas.
Supervisors:	Antoine Millon – antoine.millon@chu-lyon.fr Amandine Thomas – amandine.thomas-zanetti@univ-lyon1.fr

Place of work:	Faculty of Medicine Rockefeller, 8 avenue Rockefeller 69008 Lyon
Required degree	Master's degree or equivalent in cellular biology, physiology, biochemistry or biotechnology.
Skills/Experience:	Primary skills: Protein analysis: Western blot, proteomics; RNA biology: qPCR, polysome profiling, transcriptomics, translatome sequencing. Secondary skills: Analysis of clinical data set, animal experiment
Keywords	Atherosclerosis, Physical activity, Phosphoproteomics, Translatome, Plaque vulnerability.

Mandatory requirements

Eligibility:	The doctoral fellow: - should not have resided or carried out his/her main activity (work, study) in the country where he/she is being recruited, i.e., France, **for more than 12 months in the 3 years before the application call deadline,** unless this time was part of a compulsory national service or a procedure for obtaining refugee status under the Geneva Convention. - must be **a doctoral candidate** (not already in possession of a doctoral degree at the date of the application call deadline).
Languages:	Oral and written skills must meet the standards of academic English used in international research.

Job details

Type of contract:	Full time position
Gross salary:	The monthly **living allowance, including employer and employees' social charges, is €3,500.** This amount corresponds to a gross monthly salary estimated to €2,440 and to an estimated net monthly salary before income tax of approximately €1,976. On top of the monthly salary, the doctoral fellow will receive a **mobility allowance,** including employer and employees' social charges of €4,752 over the 36 months of the working contract. This amount corresponds to a gross monthly allowance estimated to €92 and to an estimated net monthly allowance before income tax of approximately €74.
Other benefits:	**Social Protection**: The fellow will benefit from **full social security coverage**, including health insurance, unemployment insurance, and pension contributions. He/she will also have access to occupational health services (*médecine du travail*), as required by French labour law. **Additional Insurance**: The fellow may choose to subscribe to complementary health insurance plans, at affordable rates (approximately €70 *per* month), of which 50% is paid by the employer. **Paid Leave**: The fellow is entitled to up to **33.5 days of paid leave annually** (for 35 hours worked per week), in accordance with national labour law, and will enjoy the same employment rights as other public-sector employees. **Transport**: The fellow benefits from significantly **reduced fares on public transport**, available in all partner cities. Additionally, the host institution will cover 50% of the monthly transportation costs. **Relocation assistance via Espace Ulys** (EURAXESS center of the Université de Lyon): the candidate can be provided with special relocation assistance and help for immigration and administrative, accommodation, healthcare and integration formalities. **Sports and culture:** The fellow will enjoy the cultural environment provided by the Lyon 1 campuses, where numerous exhibitions and activities open to the general public are organised throughout the year. The fellow may play his/her favourite sport in the largest University Sports Association in France, where over 30 activities are on offer year-round through the Sports & Physical Activity University Department. The fellow may also join one of the 70 student associations that unite the University.